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A. Comparison of disintegrin amino acid sequences:

B. Design of PCR primers:

**C. Overlapping extension of PCR fragments:
(a) self-extendible molecule:**

CN-N (approximately 1300 bp) 5' _____ 3' ---->
 <---3' _____ 5'
 (b) non-self-extendible molecule:
 CN-N (approximately 1300 bp) 5' _____ 3'
 <----->
 λgt10 forward
 CN-C (approximately 700 bp) 5' _____ 3'
 λgt10 reverse
 <----->

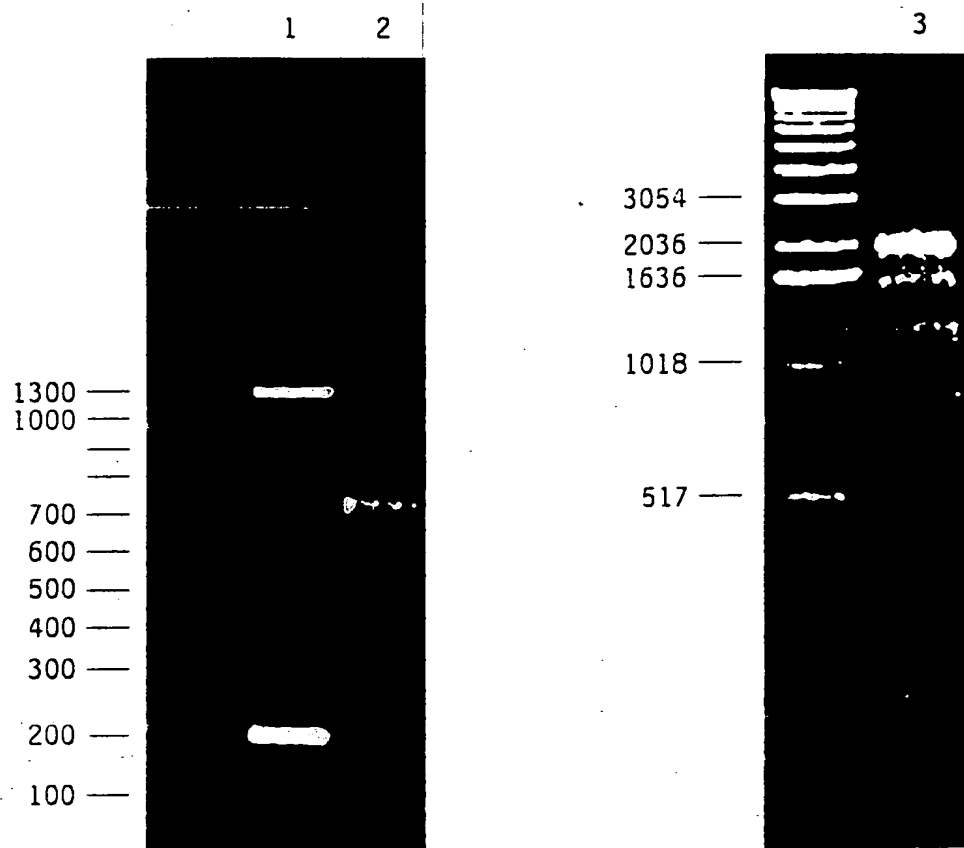


FIG. 2

FIG. 3A

	11	20	29	38	47	56													
5'	GA	ATT	CGG	GGT	CAA	TAG	AGG	AAG	AGC	TCA	AGT	TGG	CTT	GAA	AGC	AGG	AAG	AGA	TTG
	65	74	83	92	101	110													
	CCT	GTC	TTC	CAG	CCA	AAT	CCA	GCC	GCC	AAA	ATG	ATC	CAG	GTT	CTC	TTG	GTG	ACT	
[1]											M	I	Q	V	L	L	V	T	[8]
	119	128	137	146	155	164													
	CTA	TGC	TTA	GCA	GCT	TTT	CCT	TAT	CAA	GGG	AGC	TCT	ATA	ATC	CTG	GAA	TCT	GGG	
[9]	L	C	L	A	A	F	P	Y	Q	G	S	S	I	I	L	E	S	G	[26]
	173	182	191	200	209	218													
	AAT	GTT	AAT	GAT	TAT	GAA	GTA	CTG	TAT	CCA	CAA	AAA	GTC	ACT	GCA	TTG	CCC	AAA	
[27]	N	V	N	D	Y	E	V	L	Y	P	Q	K	V	T	A	L	P	K	[44]
	227	236	245	254	263	272													
	GGA	GCA	GTT	CAG	CCA	AAG	TAT	GAA	GAC	ACC	ATG	CAA	TAT	GAA	TTT	AAA	GTG	AAT	
[45]	G	A	V	Q	P	K	Y	E	D	T	M	Q	Y	E	F	K	V	N	[62]
	281	290	299	308	317	326													
	GGA	GAG	CCA	GTG	GTC	CTT	CAC	CTG	GAA	AAA	AAT	AAA	GGA	CTT	TTT	TCA	AAA	GAT	
[63]	G	E	P	V	V	L	H	L	E	K	N	K	G	L	F	S	K	D	[80]
	335	344	353	362	371	380													
	TAC	AGC	GAG	ACT	CAT	TAT	TCC	TCT	GAT	GGC	AGA	AAA	ATT	ACA	ACA	AAC	CCT	CCG	
[81]	Y	S	E	T	H	Y	S	S	D	G	R	K	I	T	T	N	P	P	[98]
	389	398	407	416	425	434													
	GTT	GAG	GAT	CAC	TGC	TAT	TAT	CAT	GGA	CGC	ATC	CAG	AAT	GAT	GCT	GAC	TCA	ACT	
[99]	V	E	D	H	C	Y	Y	H	G	R	I	Q	N	D	A	D	S	T	[116]
	443	452	461	470	479	488													
	GCA	AGC	ATC	AGT	GCA	TGC	AAC	GGT	TTG	AAA	GGA	CAT	TTC	AAG	CTT	CAA	GGG	GAG	
[117]	A	S	I	S	A	C	N	G	L	K	G	H	F	K	L	Q	G	E	[134]
	497	506	515	524	533	542													
	ACG	TAC	CTT	ATT	GAA	CCC	TTG	AAG	CTT	TCC	GAC	AGT	GAA	GCC	CAT	GCA	GTC	TAC	
[135]	T	Y	L	I	E	P	L	K	L	S	D	S	E	A	H	A	V	Y	[152]
	551	560	569	578	587	596													
	AAA	TAT	GAA	AAC	GTA	GAA	AAA	GAA	GAT	GAG	GCC	CCC	AAA	ATG	TGT	GGG	GTA	ACC	
[153]	K	Y	E	N	V	E	K	E	D	E	A	P	K	M	C	G	V	T	[170]

FIG. 3B

	605	614	623	632	641	650												
	CAG	ACT	AAT	TGG	GAA	TCA	GAT	GAG	CCC	ATC	AAA	AAG	GCC	TCT	CAG	TTA	AAT	CTT
[171]Q	T	N	W	E	S	D	E	P	I	K	K	A	S	Q	L	N	L	[188]
	659	668	677	686	695	704												
	ACT	CCT	GAA	CAA	CAA	GGA	TTC	CCC	CAA	AGA	TAC	ATT	GAG	CTT	GTT	GTA	GTT	GCA
[189]T	P	E	Q	Q	G	F	P	Q	R	Y	I	E	L	V	V	V	A	[206]
	713	722	731	740	749	758												
	GAT	CAC	AGA	ATG	TTC	ACG	AAA	TAC	AAC	GGC	AAT	TTA	AAT	ACT	ATT	AGA	ATA	TGG
[207]D	H	R	M	F	T	K	Y	N	G	N	L	N	T	I	R	I	W	[224]
	767	776	785	794	803	812												
	GTA	CAT	GAA	CTT	GTC	AAC	ACT	ATG	AAT	GTG	TTT	TAC	AGA	CCT	TTG	AAT	ATT	CGT
[225]V	H	E	L	V	N	T	M	N	V	F	Y	R	P	L	N	I	R	[242]
	821	830	839	848	857	866												
	GTC	TCA	CTG	ACT	GAC	CTA	GAA	GTT	TGG	TCA	GAC	CAA	GAT	TTG	ATC	AAC	GTG	CAG
[243]V	S	L	T	D	L	E	V	W	S	D	Q	D	L	I	N	V	Q	[260]
	875	884	893	902	911	920												
	CCA	GCA	GCG	GCT	GAT	ACT	TTG	GAA	GCA	TTT	GGA	GAC	TGG	AGA	GAG	ACA	GTC	TTG
[261]P	A	A	A	D	T	L	E	A	F	G	D	W	R	E	T	V	L	[278]
	929	938	947	956	965	974												
	CTG	AAT	CGC	ATA	AGT	CAT	GAT	AAT	GCT	CAG	TTA	CTC	ACG	GCC	ATT	GAG	CTT	GAT
[279]L	N	R	I	S	H	D	N	A	Q	L	L	T	A	I	E	L	D	[296]
	983	992	1001	1010	1019	1028												
	GGA	GAA	ACT	ATA	GGA	TTG	GCT	AAC	AGG	GGC	ACC	ATG	TGC	GAC	CCG	AAG	CTT	TCT
[297]G	E	T	I	G	L	A	N	R	G	T	M	C	D	P	K	L	S	[314]
	1037	1046	1055	1064	1073	1082												
	ACA	GGA	ATT	GTT	CAG	GAT	CAT	AGT	GCA	ATA	AAT	CTT	TGG	GTT	GCA	GTT	ACA	ATG
[315]T	G	I	V	Q	D	H	S	A	I	N	L	W	V	A	V	T	M	[332]
	1091	1100	1109	1118	1127	1136												
	GCC	CAT	GAG	ATG	GGT	CAT	AAT	CTG	GGT	ATT	AGT	CAC	GAT	GGA	AAT	CAG	TGT	CAT
[333]A	H	E	M	G	H	N	L	G	I	S	H	D	G	N	Q	C	H	[350]
	1145	1154	1163	1172	1181	1190												
	TGC	GAT	GCT	AAC	TCA	TGC	ATT	ATG	AGT	GAA	GAA	CTA	AGA	GAA	CAA	CTT	TCC	TTT
[351]C	D	A	N	S	C	I	M	S	E	E	L	R	E	Q	L	S	F	[368]

FIG. 3C

1199	1208	1217	1226	1235	1244
GAG TTC AGC	GAT TGT AGT	CAG AAT CAA	TAT CAG ACA	TAT CTT ACT	GAT CAT AAC

[369]E	F S D C S Q N Q Y Q T Y L T D H N	[386]			
1253	1262	1271	1280	1289	1298
CCA CAA TGC	ATG CTC AAT	GAA CCC TTG	AGA ACA GAT	ATT GTT TCA	ACT CCA GTT

[387]P	Q C M L N E P L R T D I V S T P V	[404]			
1307	1316	1325	1334	1343	1352
TCT GGA AAT	GAA CTT TTG	GAG ACG GGA	GAA GAA AGT	GAC TTT GAC	GCT CCT GCA

[405]S	G N E L L E T G E E S D F D A P A	[422]			
1361	1370	1379	1388	1397	1406
AAT CCG TGC	TGC GAT GCT	GCA ACA TGT	AAA CTG ACA	ACA GGG TCA	CAG TGT GCA

[423]N	P C C D A A T C K L T T G S Q C A	[440]			
1415	1424	1433	1442	1451	1460
GAT GGA CTG	TGT TGT GAC	CAG TGC AAA	TTT ATG AAA	GAA GGA ACA	GTA TGC CGG

[441]D	G L C C D Q C K F M K E G T V C R	[458]			
1469	1478	1487	1496	1505	1514
AGA GCA AGG	GGT GAT GAC	CTG GAT GAT	TAC TGC AAT	GGC ATA TCT	GCT GGC TGT

[459]R	A R G D D L D D Y C N G I S A G C	[476]			
1523	1532	1541	1550	1559	1568
CCC AGA AAT	CCC TTC CAT	GCC TAA CCA	ACA ATG GAG	ATG GAA TGG	TCT GCA GCA

[477]P	R N P F H A *	[483]			
1577	1586	1595	1604	1613	1622
ACA GGC AGT	GTG TTG ATC	TGA ATA CAG	CCT AAT AAT	CAA CCT CTG	GCT TCT CTC
1631	1640	1649	1658	1667	1676
AGA TTT GAT	CAT GGA GAT	CCT TCT TCC	AGA AGG TTT	CAC TTC CCT	CAA ATC CAA
1685	1694	1703	1712	1721	1730
AGA GAC CCA	TCT GCC TGC	ATC CTA CTA	GTA AAT CAC	CCT TAG CTT	CCA GAT GGT
1739	1748	1757	1766	1775	1784
ATC CAA ATT	CTG TAA TAT	TTC TTC TCC	ATA TTT AAT	CTA TTT ACC	TTT TGC TGT
1793	1802	1811	1820	1829	1838
AAC AAA ACC	TTT TTC CTG	TCA CAA AGC	TCC ATG GGC	ATG TAC AGC	TTA TCT GCT
1847	1856	1865	1874	1883	1892
GTC AAG AAA	AAA AAT GGC	CAT TTT ACC	GTT TGC CAG	TTA CAA AGC	ACA TTT AAT
1901	1910	1919	1928	1937	1946
GCA ACA AGT	TCT TCC TTT	TGA GCT GAT	GTA TTC AAA	GTC AAT GCT	TCC TCT CCC

FIG. 3D

1955	1964	1973	1982	1991	2000
AAA ATT TCA TGC TGG CTT CCC AAG ATG TAG CTG CTT CCG TCA <u>ATA AAC</u> AAA CTA					
2009	2018	2027			
TTC TCA TTC <u>AAA AAA AAA AAC</u> CCG AAT TC 3'					

FIG. 4-1

Proprotein domain:

	1	10	20	30	40	50
	*	*	*	*	*	*
CN	MIQVLLVTLCIAAFPYQGSSIIILESGNVNDYEVLYPQKVTALPKGAVQPKY					
Trigramin	MIQVLLITICLAVFPYQGSSIIILESGNLNDYEVVYPEKVTALPKGAVQPKY					
Cat	MIQVLLVTICLAAFPYQGSSIIILESGNVNDYEVYPRKVTALPKGAVQPKY					
Jararhagin						ATRPKGAVQPKY
Ht-e	MIQVLLVTICLAAFPYQGSSIIILESGNVNDYEVYPRKVTALPKGAVQPKY					
		110	120	130	140	150
		*	*	*	*	*
CN	DHCYYHGRIQNDADSTASISACNGLKGHFKLQGETYLIIEPLKLSDEAHAV					
Trigramin	DHCYYHGRIENDADSTASISACDGLKGHFKLQGEMYLIEPLELSDSEAHAV					
Cat	DHCYYHGRIENDADSTASISACNGLKGHFKLQGEMYLIEPLKLPDSEAHAV					
Jararhagin	DHCYYHGRIENDADSTASISACNGLKGYFKLQRETYFIEPLKLPDSEAHAV					
Ht-e	DHCYYHGRIENDADSTASISACNGLKGHFKLQGEMYLIEPLKLSDEAHAV					

Metalloproteinase domain:

	200	210	220	230	240
	*	*	*	*	*
CN	EQQGF.PQRYIELVVADHRMFTKYNGNLNTIRIWWHELVTMNVFYRPLN				
Trigramin	EQQRF.PQRYIKLGIFVDHGMVTKYSGNSERITKRVHQMINNINMMCRALN				
Cat	EHQKYNPFRFVELFLVVDKAMVTKNNGDLKIKTRMYEIVNTVNEIYRYMY				
Jararhagin	EQQRYDPYKIEFFVVVDQGTVTKNNGDLKIKARMYELANIVNEIFRYLY				
Ht-e	EHQ.....RYVELFIVVDHGMVTKYNGSDKIRQRVHQMVMNIMKESYTYMY				
	290	300	310	320	330
	*	*	*	*	*
CN	LTAIELDGETIGLANRGTMCDPKLSTGIVQDHSAINLWVAVTMAHEMGHNL				
Trigramin	LTATIFNGNVIGRAPVGGMCDPKRSVAIVRDHNAIVFVAVTMTHEMGHNL				
Cat	LTAIDL.DRVIGLAYVVGSMCHPKRSTGIIQDYSEINLVAVIMAHEMGHNL				
Jarahagin	LTAIDFNGPTIGYAYIGSMCHPKRSVGIVQDYSPINLVAVIMAHEMGHNL				
Ht-e	LTSIAFDEQIIGRAYIGGICDPKRSTGVVQDHSEINLRVAVTMTHELGHNL				

Disintegrin domain:

	420	430	440	450
	*	*	*	*
CN	ETGEESDF---DAOABOCCDAATCJKTGSGCADGKCCDQCJFNJEGTVCR			
Trigramin	EAGEDCDCGSPA...NPCCDAATCKLIPGAQCGEGLCCDQCSFIEEGTVCR			
Cat	EVGEECDGTPENCQNECCDAATCKLKSGSQCGHGDCEQCKFSKSGTECR			
Jararhagin	EVGEECDGTPENCQNECCDAATCKLKSGSQCGHGDCEQCKFSKSGTECR			
Ht-e	EAGIECDGGSLE...NPCCYATTCKMRPGSQCAEGLCCDQCRFMKKGTVCR			

C-terminal domain:

	490	500	510	520	530
	*	*	*	*	*
Cat	NGQPCLDNYGYCYNGNCPIMYHQCVDLFGADVVEAEDSCFERNQKGNYYGY				
Jararhagin	NGQPCLDNYGYCYNGNCPIMYHQCVALFGADVVEAEDSCFKDNQKGNYYGY				
	590	600			
	*	*			
Cat	PGTKCADGKVCSNGHCVDVATAY*				
Jararhagin	PGTKCADGKVCSNGHCVDVATAY				

FIG. 4-2

60 70 80 90 100
* * * * *
EDTMQYEFKVNGEPPVLHLEKNKGLFSKDYSETHYSSDGRKITTNPVE
EDAMQYEFKVNGEPPVLHLEKNKGLFSEDYSEIHYSPOGREITAYPSVE
EDAMQYELKVNGEPPVLHLGKNKGLFSKDYSETHYSPOGREITTYPLVE
EDAMQYEFKVNGEPPVLHLEKNKGLFSKDYSEIHYSPOGREITTYPPVE
EDTMQYELKVNGEPPVLHLEKNKGLFSKDYSETHYSFDGRKITTNPVSVE

160 170 180 190
* * * * *
YKYENVEKEDEAPKMGVTQTNWESDEPIKKASQLNLTP
FKYENVEKEDEPPKMGVTQ.NWESYESTKKASQLNVTP
YKYENVEKEDEALKMGVTQ.NWESYEPICKASQLVVT
FKYENVEKEDEAPKMGVTQ.NWKSYPEIKKASQLAFTA
FKLKNVEKEDEAPKMGVTQ.NWESYEPICKASDLNLNP

250 260 270 280
* * * * *
IRVSLTDLEVWSDQDLINVQPAADTLEAFGD.WRETVLLNRISHDNAQL
IVTTLSVLEIWSEKDLITVQ.ASAPTTLTFGAWRETVLLNRTSHDNAQL
IHVALVGLEIWSNEDKITVKPEAGYTLNA.FGEWRKTDLLTRKKHDNAQL
MHVALVGLEIWSNGDKITVKPDVDYTLNS.FAEWRKTDLLTRKKHDNAQL
IDILLAGIEIWSNGDLINVQPASPNTLNS.FGEWRETDLLKRKSHDNAQL

350 360 370 380 390 400 410
* * * * *
GISHDGNQCHCDANSCIMSEELREQLSFEFSDCSQNQYQTYLTDHNPQCMLNEPLRTDIVSTPVSGNELL
GMHHDEDKCNCN..TCIMSKVLSRQPSKYFSECSKDYQYQTFLTNHNPCILNAPLRTDTVSTPVSGNELL
GINHDSGYCSCGDYACIMRPEISPEPSTFFSNCSYFECWDFIMNHNPECILNEPLGTDIISPPVCGNELL
GIHHDTGSCSCGDYPCIMGPTISNEPSKFFSNCSYIQCWDFIMNHNPECIINEPLGTDIISPPVCGNELL
GIHHDTDSCSCGGYSCIMSPVISDEPSKYFSDCSYIQWDFIMNQKPCILKKPLRTDTVSTPVSGNELL

460 470 480
* * *
RARGD.DLDDYCNGISAGCPRNPFHA*
IARGD.DLDDYCNGRSAGCPRNPFHA
ASMSECDPAEHCTGQSSECPADVFK
ASMSECDPAEHCTGQSSECPADVFK
VSMVDRN.DDTCTGQSADCPRNGLYG*

540 550 560 570 580
* * * * *
CRKENGKIPCAPEDVKCGRLYCKDNSPGQNNPCKMFYSNEDEHKGMVL
CRKENGKKIPCAPEDVKCGRLYCKDNSPGQNNPCKMFYSNDDEHKGMVL

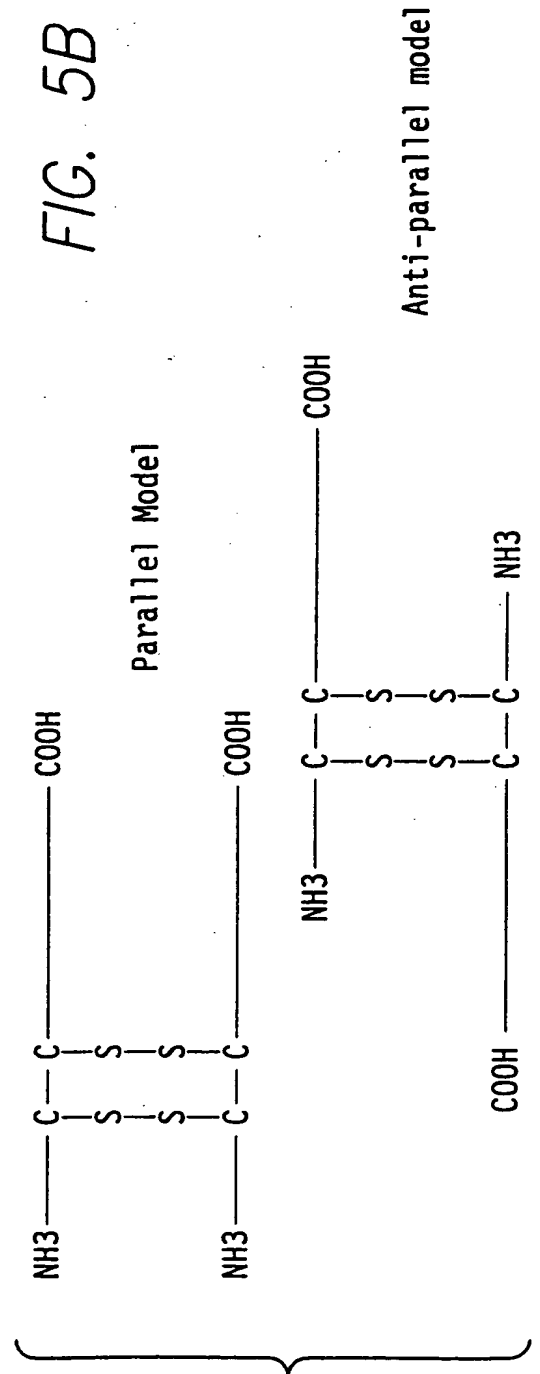
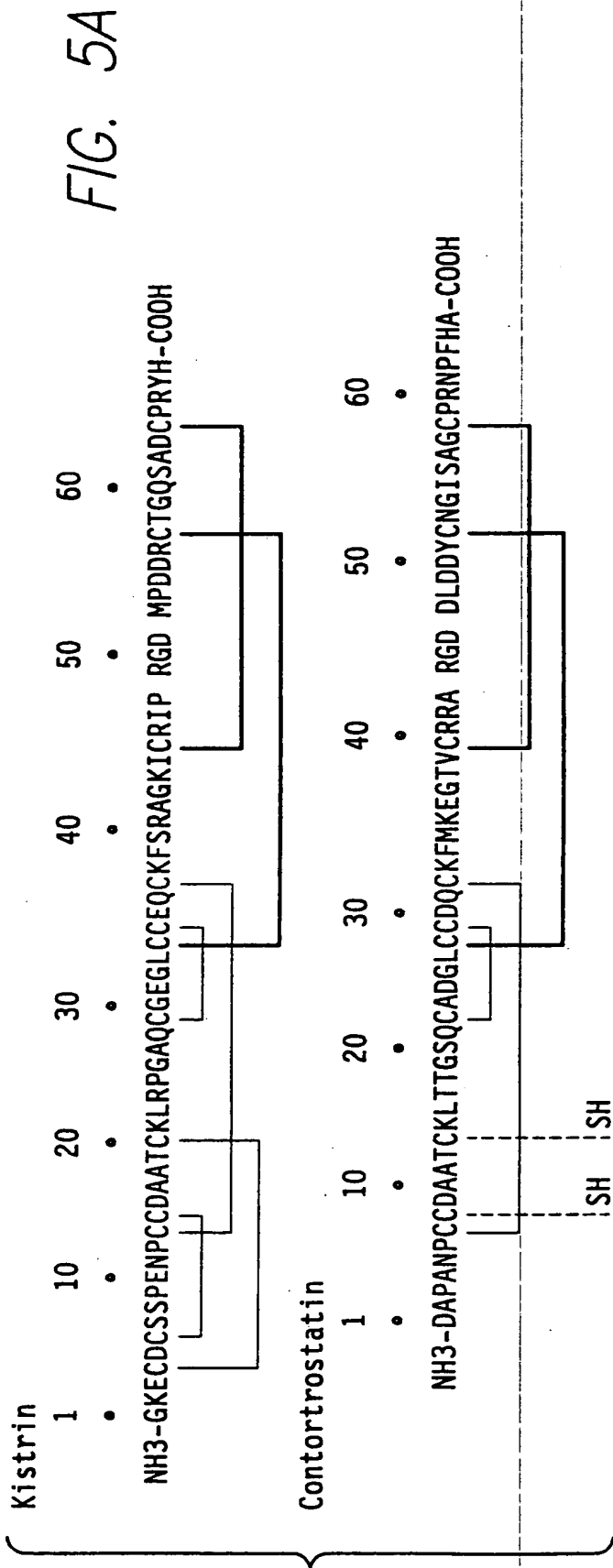


FIG. 6

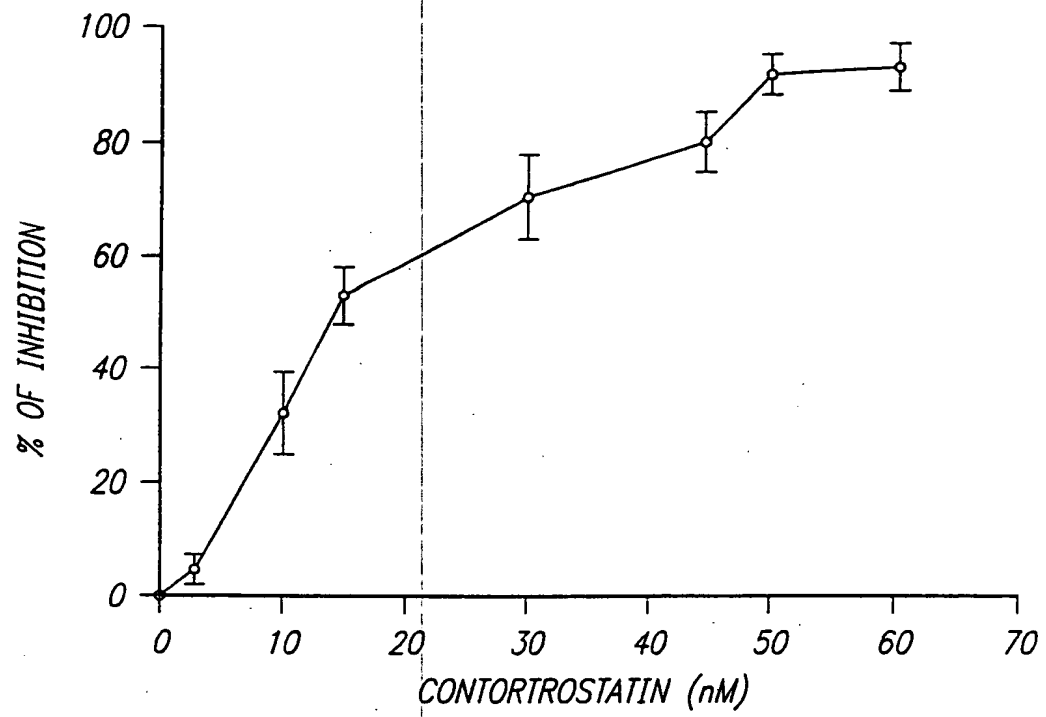


FIG. 7

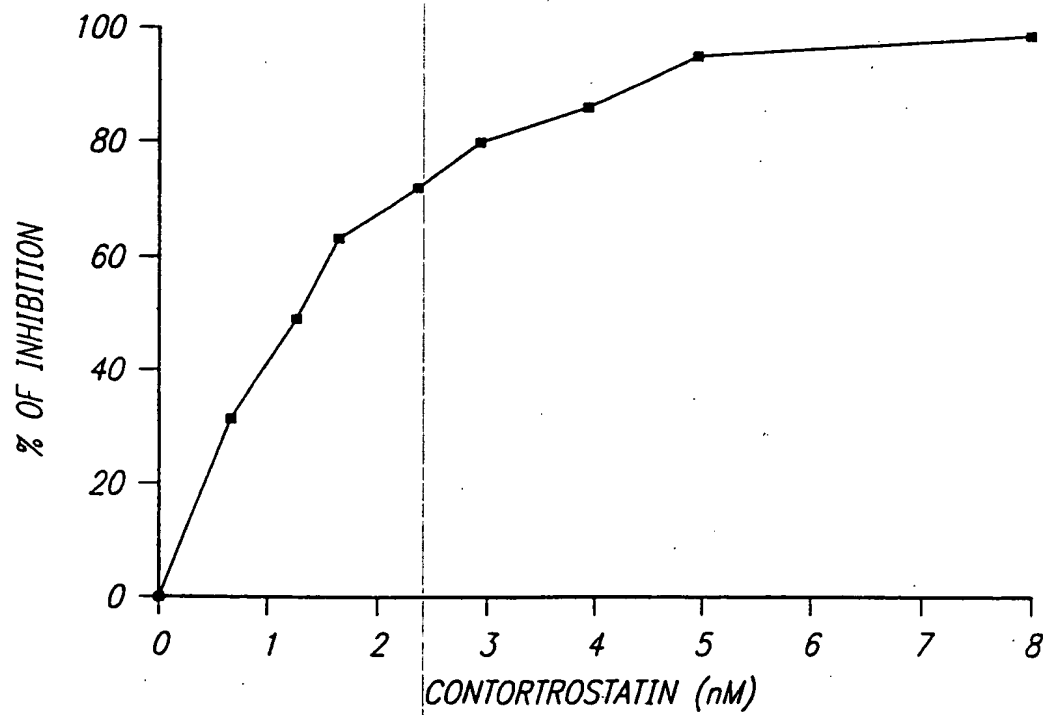


FIG. 8

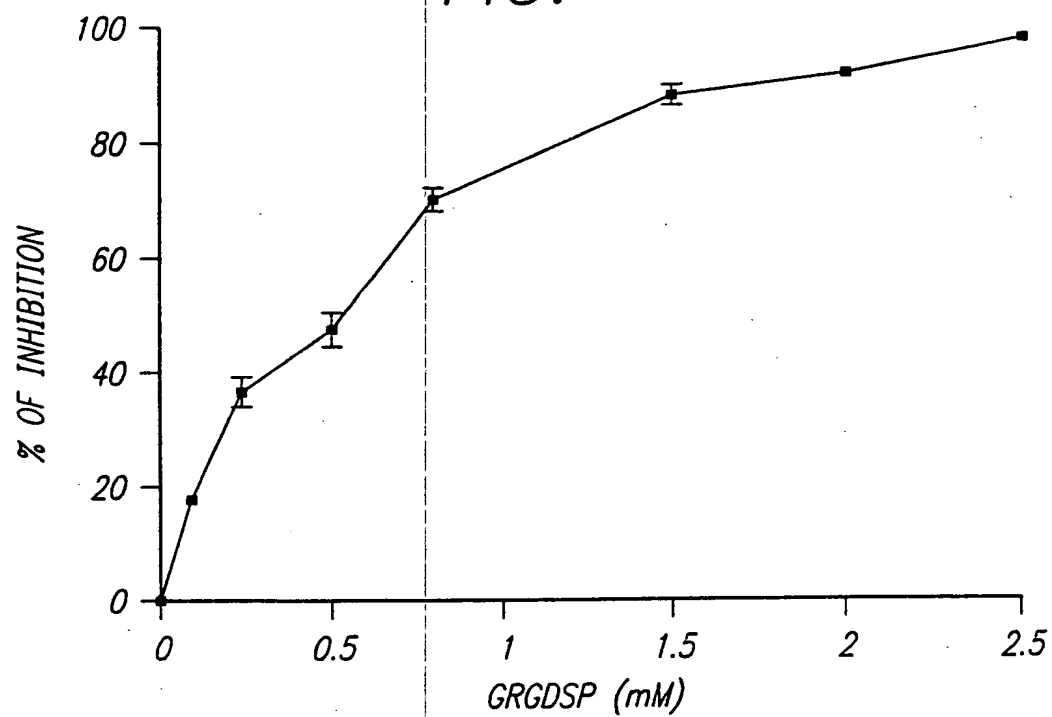
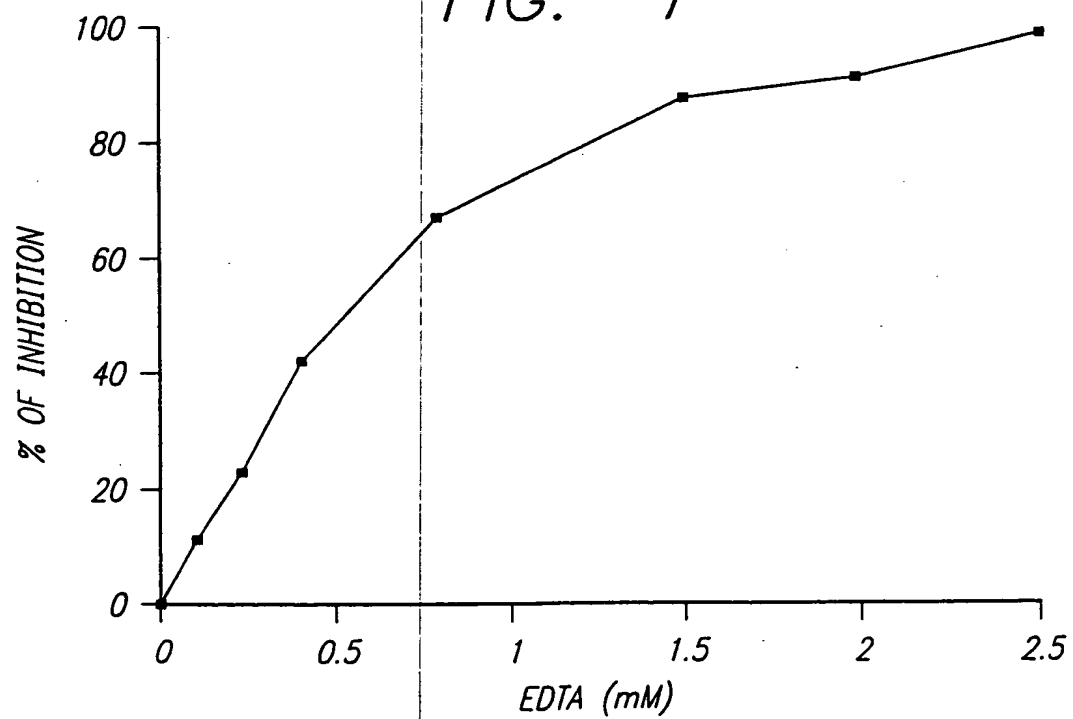


FIG. 9



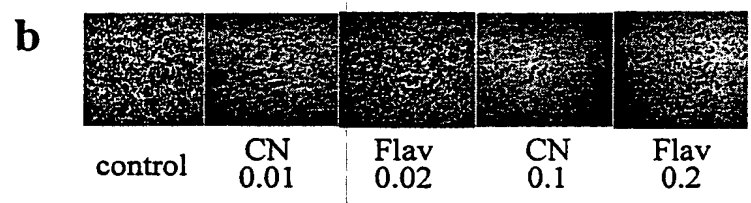
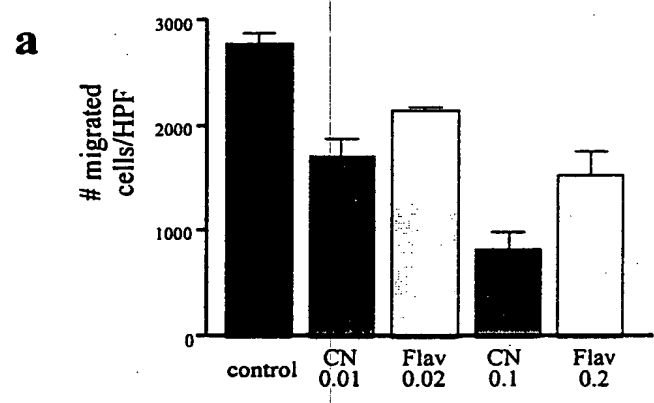


FIG. 10

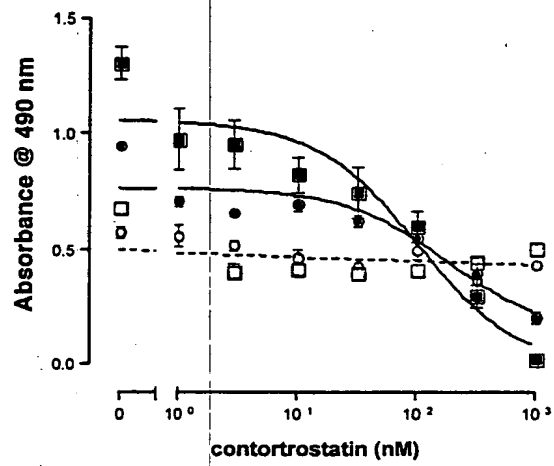
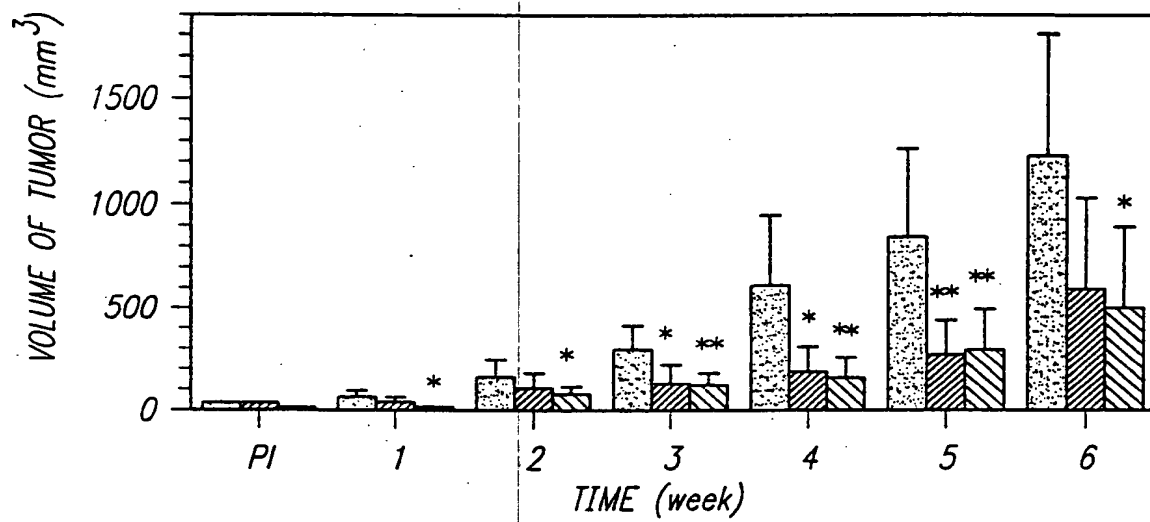


FIG. 11

FIG. 12



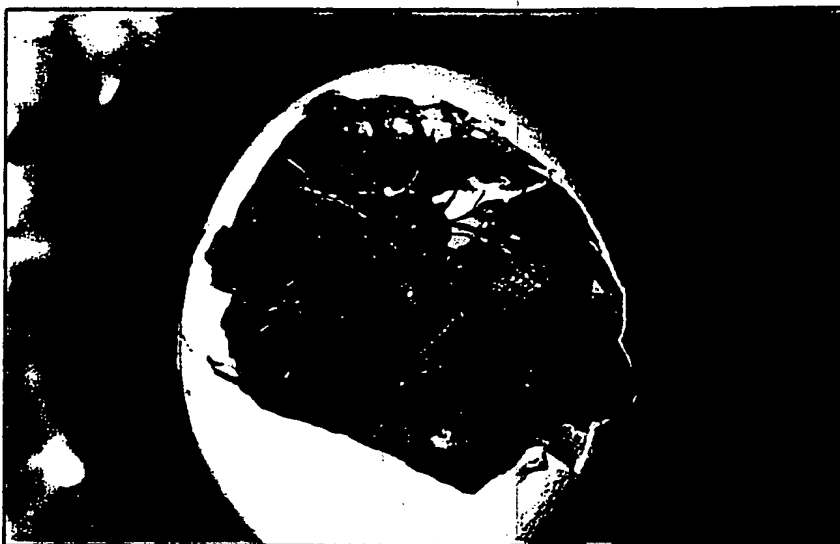


FIG. 13A

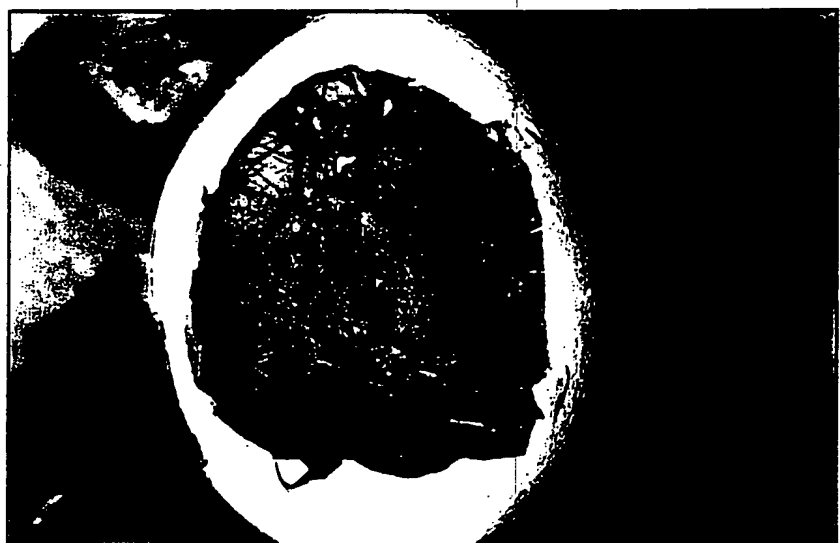


FIG. 13B

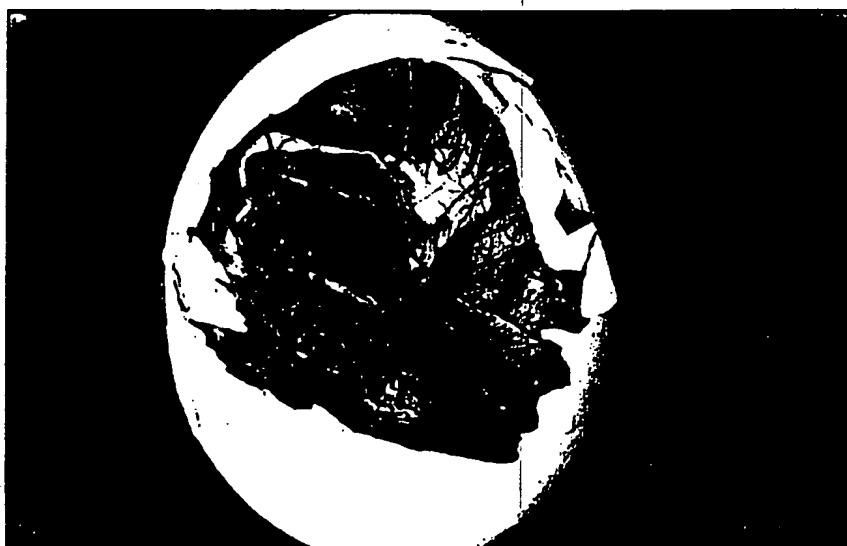
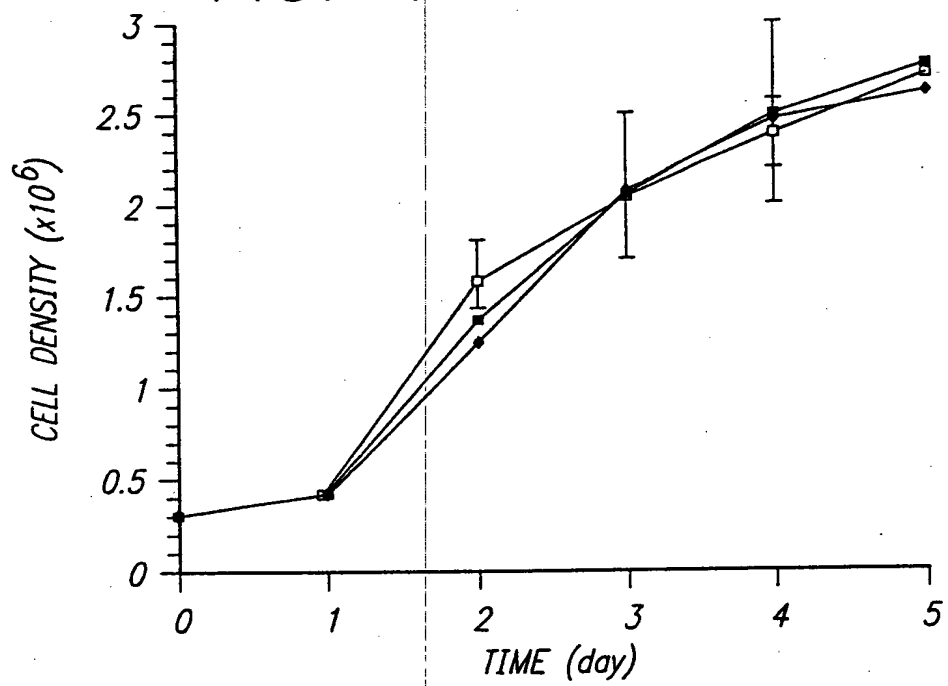
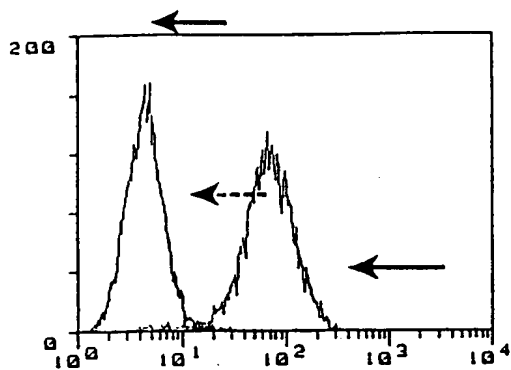


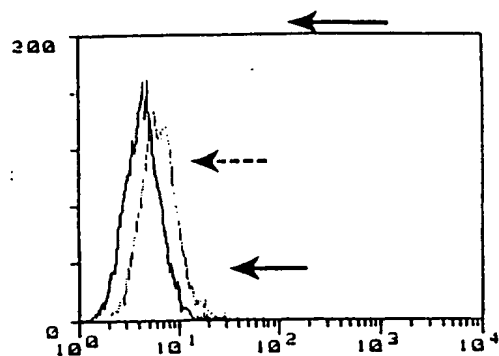
FIG. 13C

FIG. 14

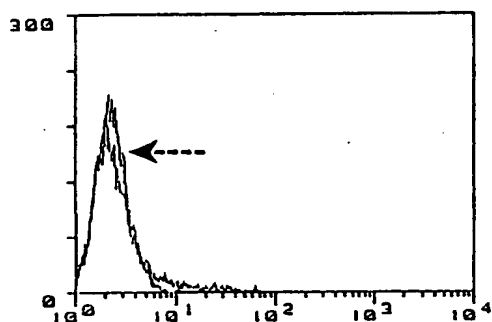




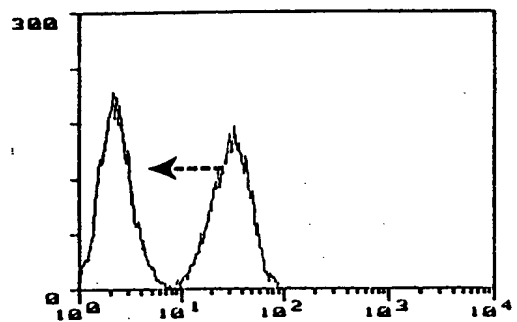
(A)



(B)



(C)



(D)

FIG. 15

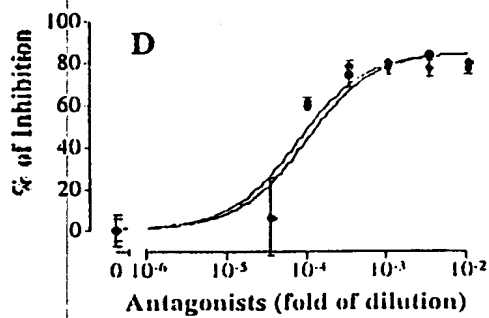
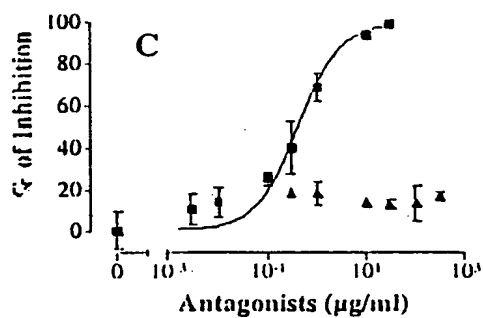
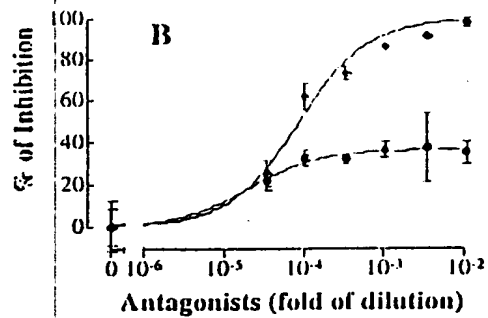
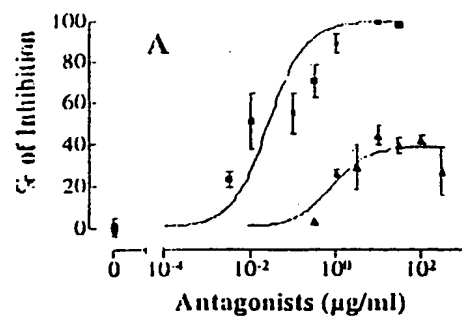


FIG. 16

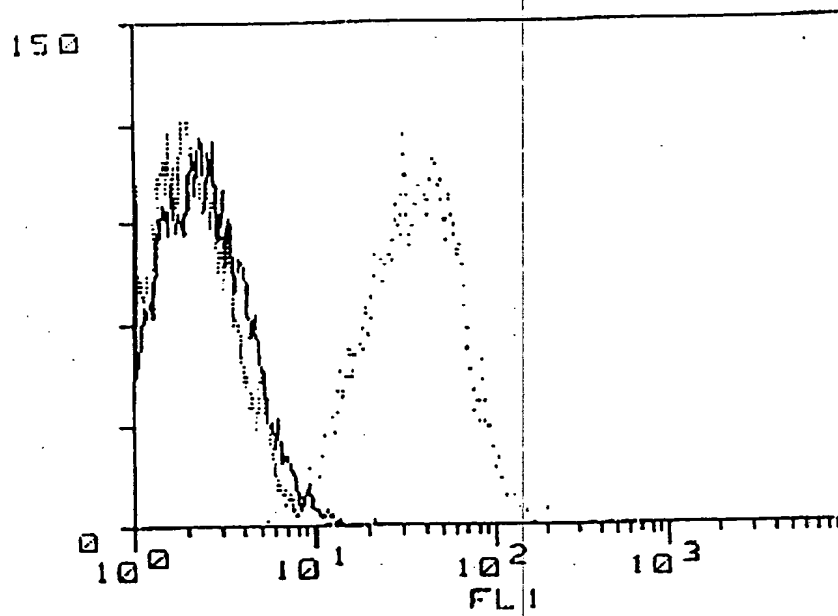


FIG. 17

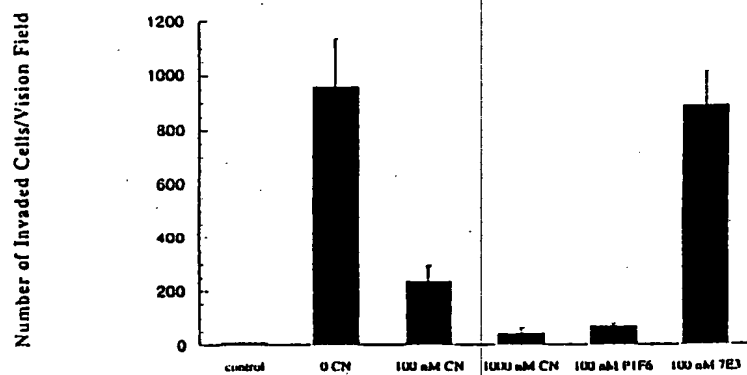


FIG. 18

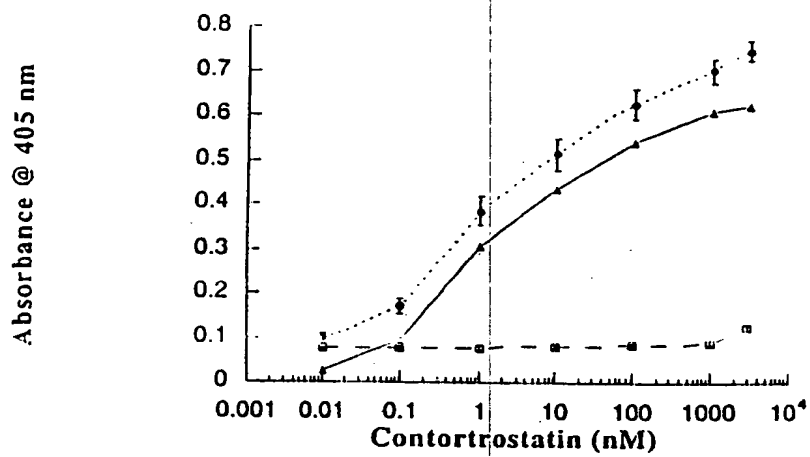


FIG. 19

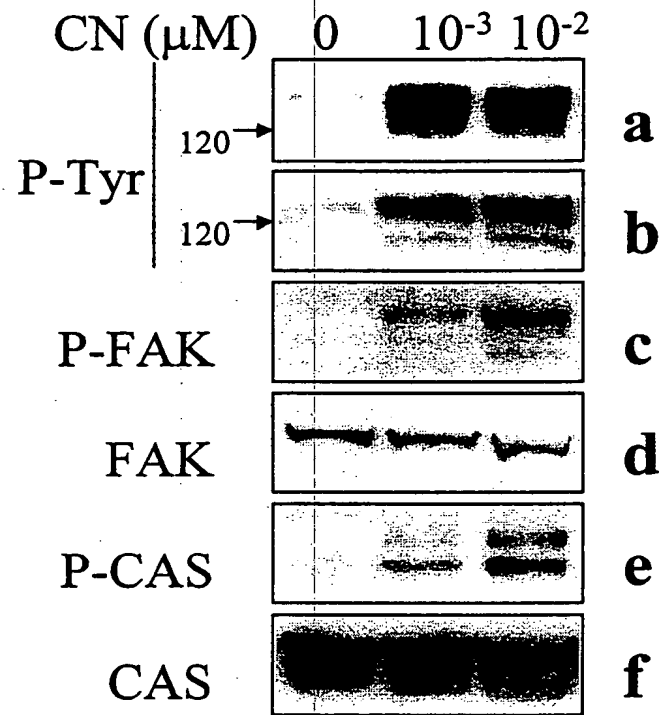


FIG. 20

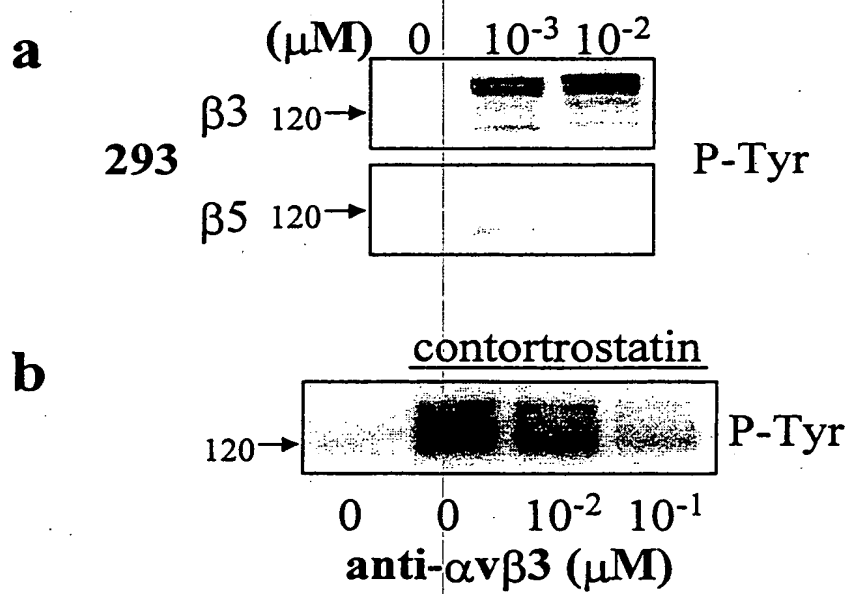


FIG. 21

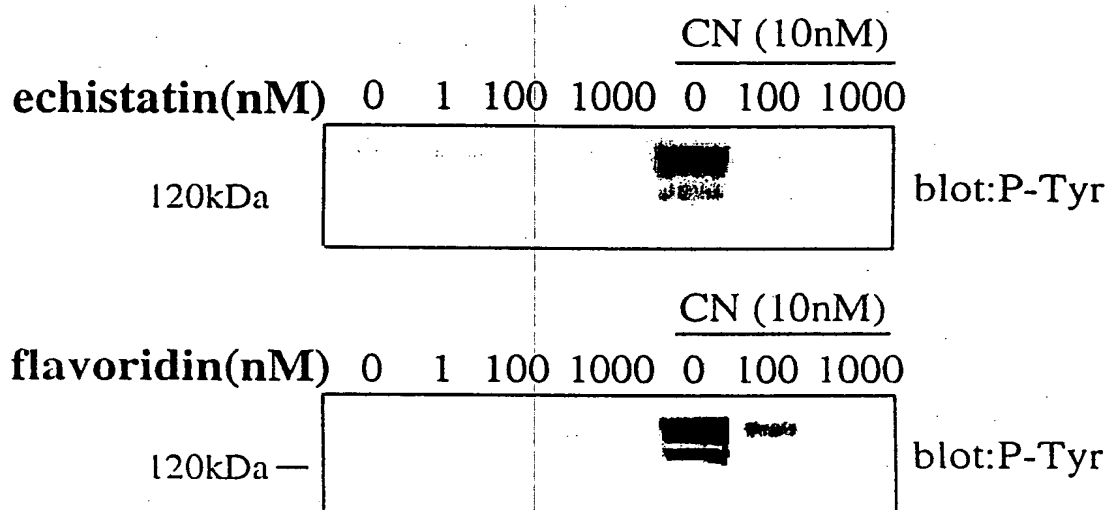
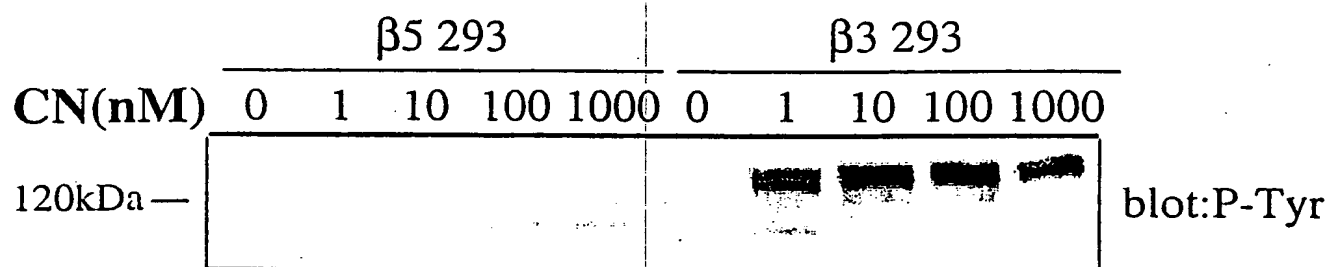


FIG. 22

A



B

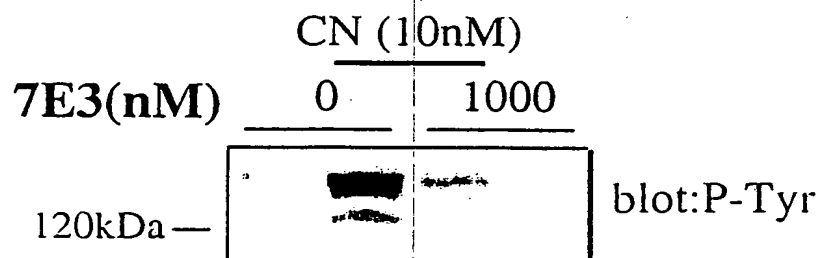
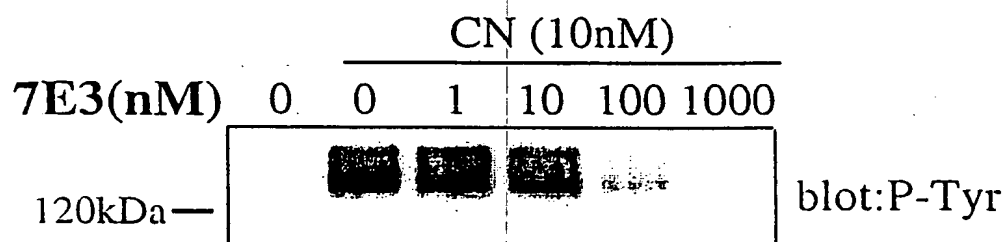


FIG. 23

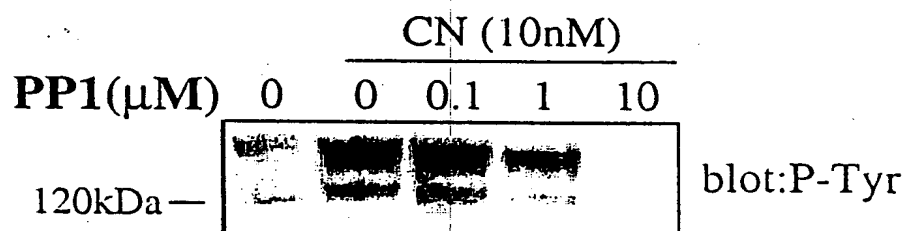
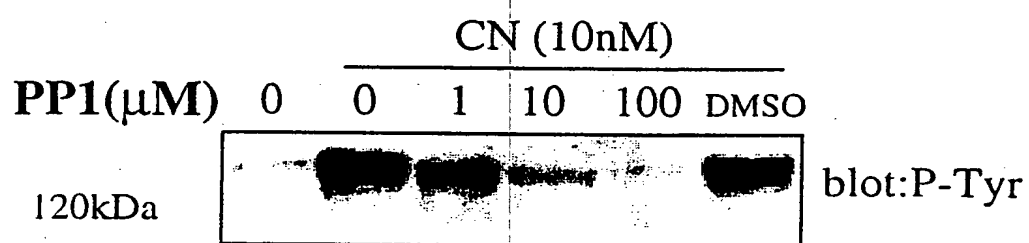


FIG. 24

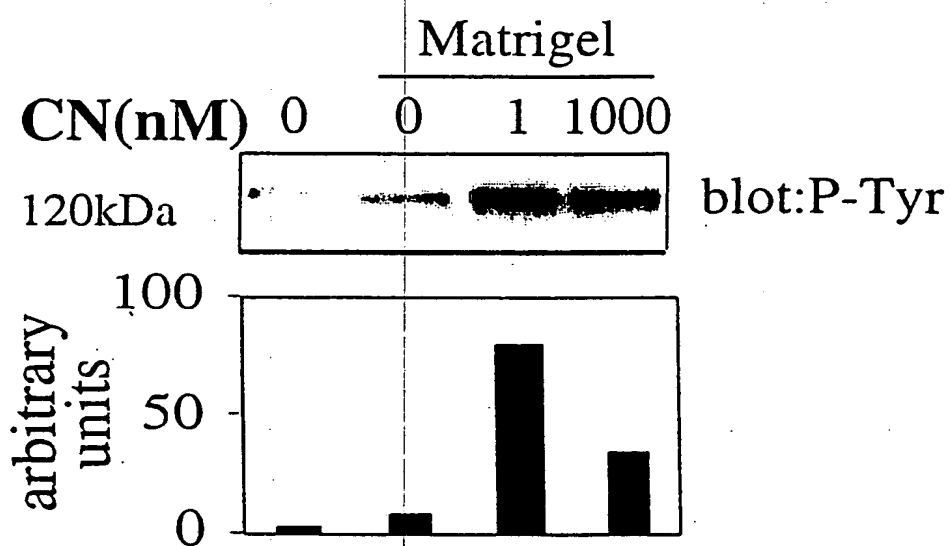


FIG. 25

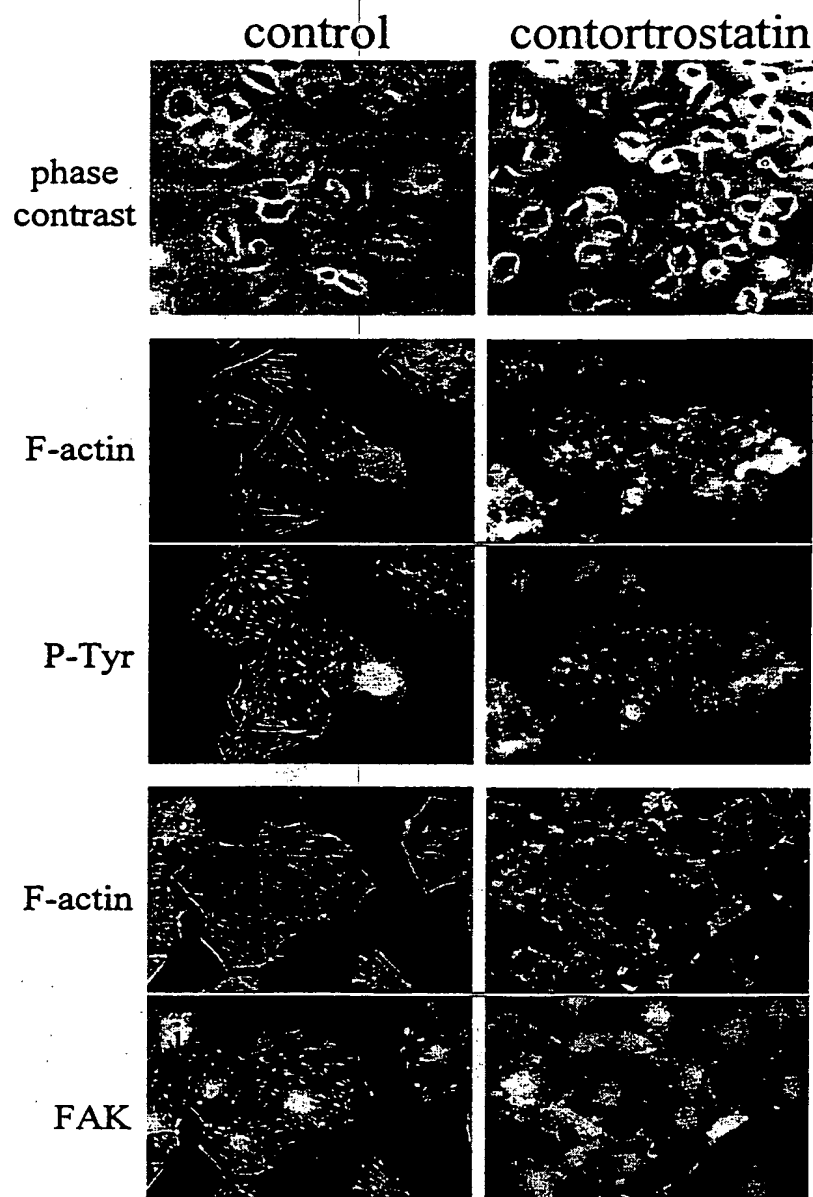


FIG. 26

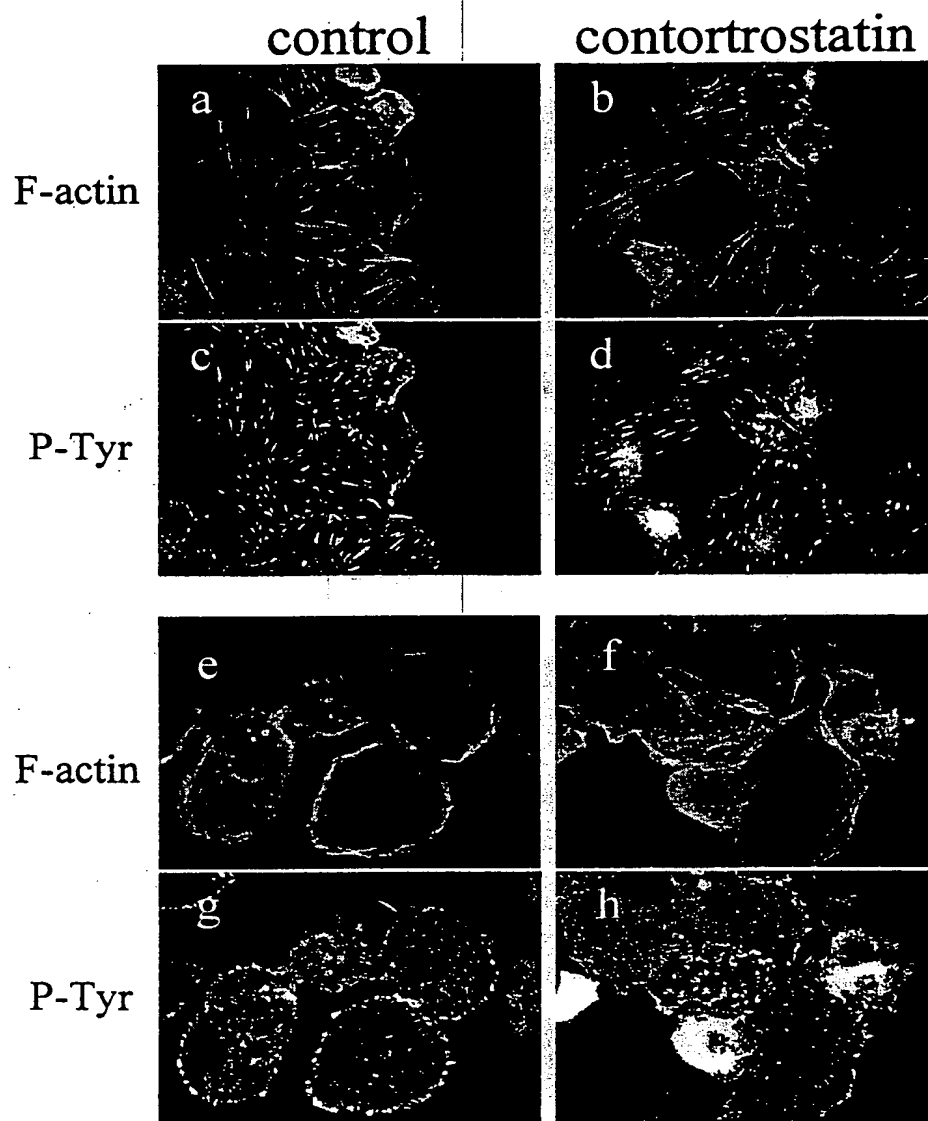


FIG. 27

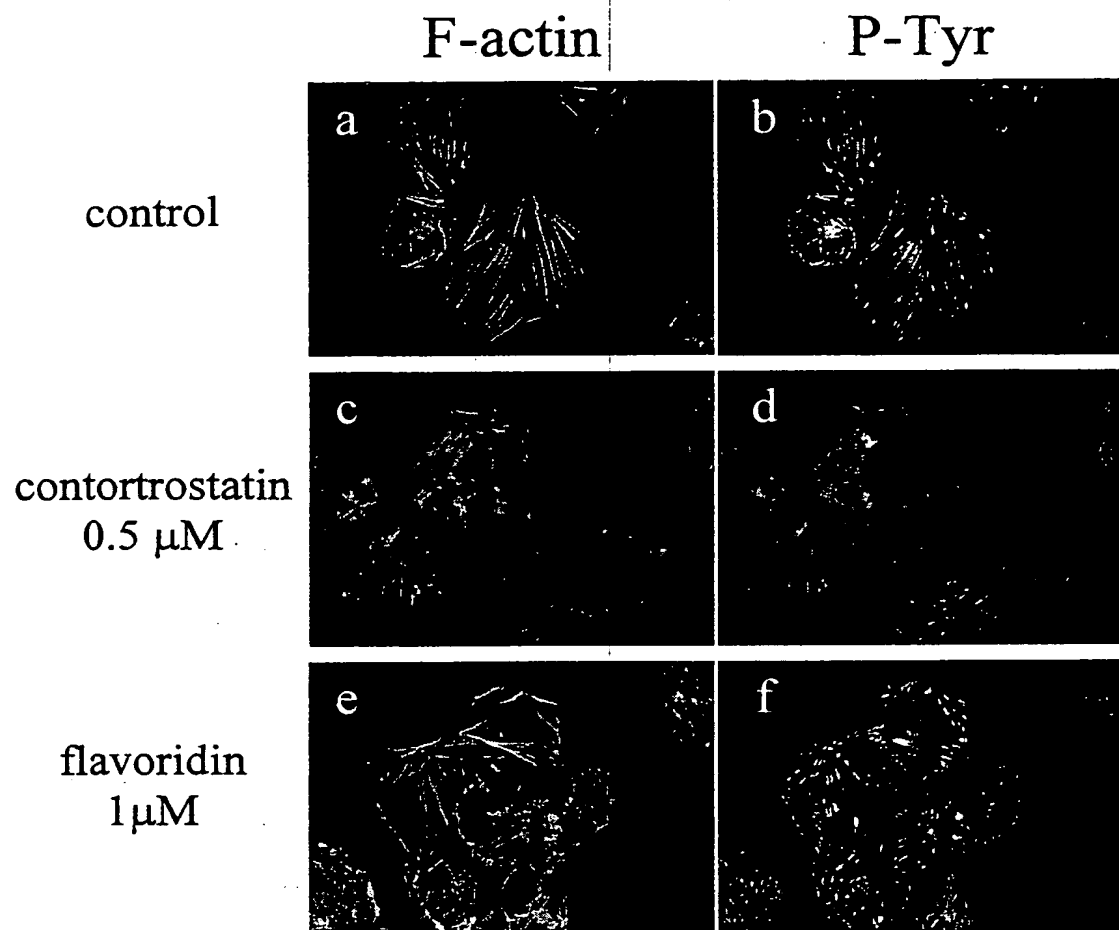


FIG. 28

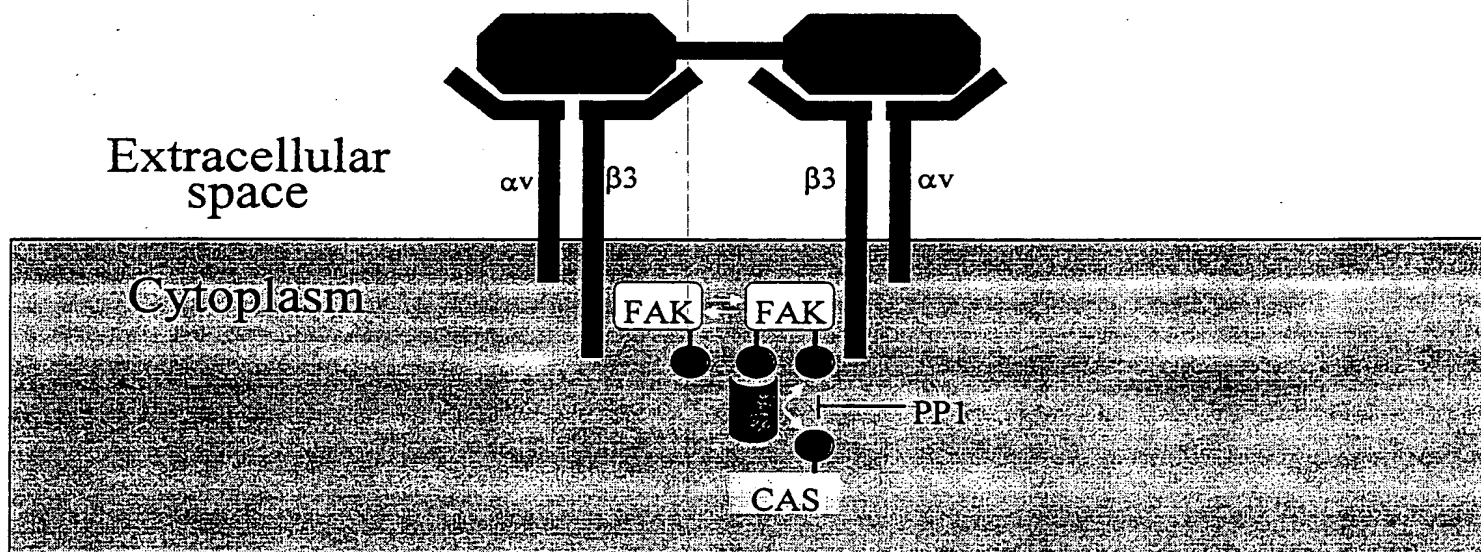


FIG. 29

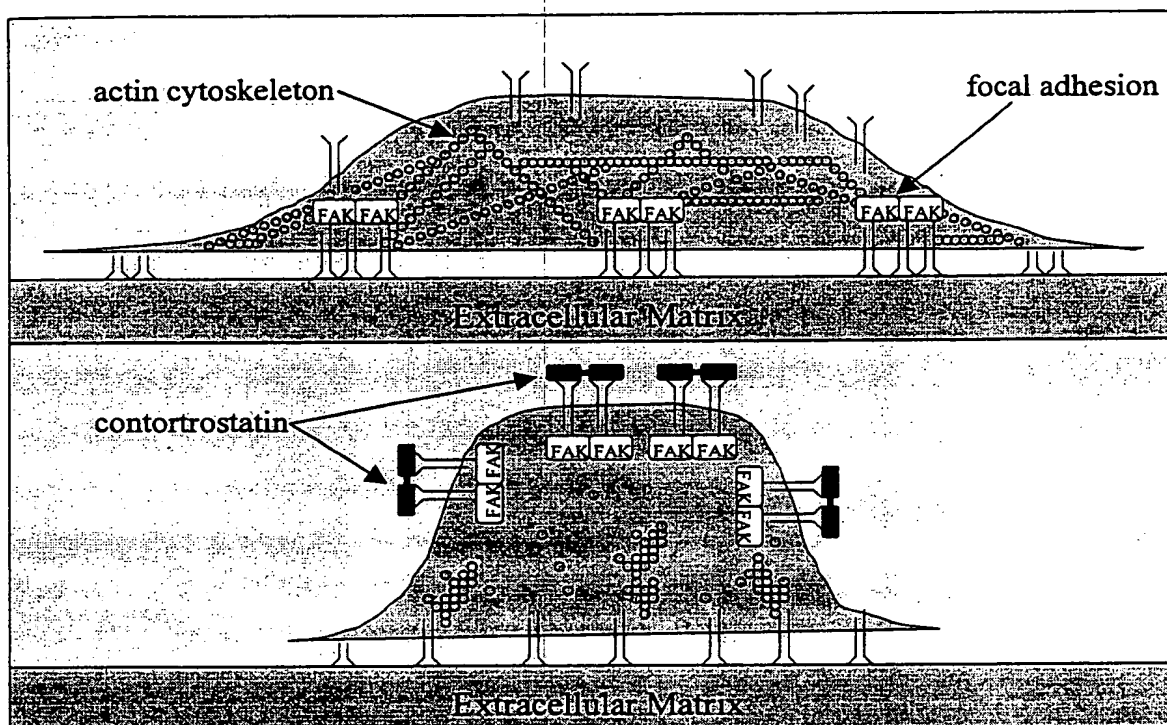


FIG. 30